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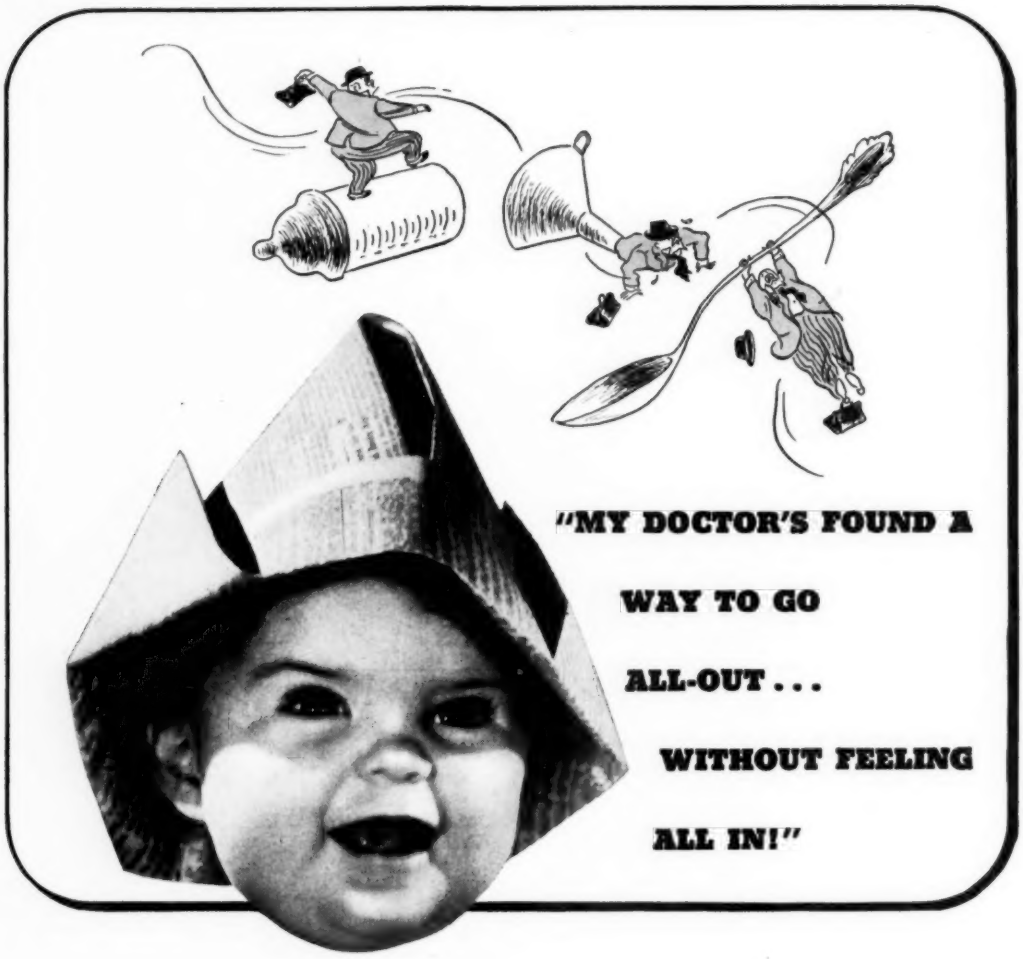

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The Problem of the Ruptured Intervertebral Disk

ROGER G. DOUGHTY, B.S., M.D., COLUMBIA, S. C.

The Ruptured Intervertebral Disk is a subject which has engendered intense and at times bitter debate. It is almost certainly our most recently recognized clinical entity and there is surely much yet to be learned about it. It therefore deserves our serious consideration.

As yet there seem to be only two points upon which there is general agreement. First that it is a clinical entity, and second that, at least, in many instances, it is best treated surgically.

Anatomically the intervertebral disk is not just a flat hunk of cartilage between two vertebrae. Somewhat nearer the posterior edge there is a very soft small mass of fibro-cartilage with irregular connective tissue bands called the nucleus pulposus. The entire disk is held between the vetebrae by a capsule which is weakest on each side of the midline posteriorly. Flexion of the spine puts the point surfaces of the vertebrae in a V shaped position. If a compression force is then applied the soft nucleus pulposus is inevitably forced backward, away from the point of the V and against the wall of the capsule. Rupture of the capsule frequently occurs, the rent usually being to one side or the other of the midline. Through this tear a portion of the soft nucleus pulposus extrudes into the bony canal. The extruded mass occupies space reserved for the component parts of the nervous system and presses upon them. It is a curious fact that the compression force causing this is almost never great. This led to the theory that a severe force tears the ligament widely, permitting the complete extrusion of a thoroughly disintegrated nucleus pulposus and that the absorption of the pulverized tissue proceeds rapidly giving a spontaneous cure. Conversely the theory suggests a weakening of the capsule permitting only a bulge in some instances, the so-called "concealed disk." Actually this concealed type occurs in over half the cases.

In the absence of a severe tear of the capsule absorption of the damaged cartilage is slow, particularly for that portion left within the joint, for the blood supply is very meager. We have then in essence a chronic traumatic arthritis with pressure upon elements of the nervous system superimposed. However, the intervertebral cartilage permits an approximation of the bodies of the verterbrae. This, though slight, puts a greater strain upon the two facet joints than they are able to bear. Magnuson points that a traumatic arthritis is thereby established in these joints. The resultant swelling encroaches upon the very limited space of exit of the spinal nerve, irritating it.

The clinical picture of the ruptured disk can be outlined from the mechanics of the lesion to a most unusual degree. Compression trauma such as a sudden fall to a sitting posture, is often the exciting cause, though frequently the trauma is slight enough to be completely forgotten. Pain in the back usually follows immediately but is often rather mild at first. This is the local backache due to the joint trauma. Like most joint lesions the discomfort is relieved by rest and made worse by movement.

The immediate protrusion of a large cartilaginous mass does not occur in most instances. Should this happen however, the pressure upon the cord, cauda equina or, as most usual, upon the emerging nerve, gives rise at once to symptoms in more distant parts of the body. The picture here varies of course from that of a complete section of the cord to that of a mild irritation of a single spinal nerve.

It is well to recall that the true nature of the condition was first recognized through a realization that the cartilage occasionally found within the dura during operations for cord tumor was not an enchondroma as had been thought but had come from the intervertebral joint. The cartilage, therefore, had, of necessity, perforated the dura.

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*Read at annual meeting S. C. Medical Assoc., Columbia, April 12, 1944.

Most often the damage is much less extensive. The amount of cartilage extruded is usually small, or there is simply a bulge of the capsule and no extrusion in the fullest sense of the word. In this event pressure on the emerging nerve, or other nerve elements, only develops at a later date as the mass slowly increases by further extrusion. As a result of the narrowing of the intevertebral space oedema of the facet joints begins, also increasing the pressure upon the nerve root.

There are then three recognizable phases, 1. (a slight bulge of the capsule, the so-called concealed disk) 2. (a small tear in the capsule and the extrusion of a small amount of cartilage debris, and 3. (a tear of the capsule and the extrusion of a large amount of damaged cartilage. In the first two, referred pain due to nerve pressure is slow in appearing. In the last instance symptoms referable to the nervous system appear immediately and vary from those produced by mild pressure to those of complete destruction of nerve tissue. We are as yet unable to accurately diagnose ruptured disks before nerve pressure produces symptom though the existence of such a lesion may be suspected.

While any vertebral joint may be involved the rupture usually occurs in a portion of the spine that is normally curved. The lumbar area is especially vulnerable. Love, Dandy and Spurling all find that at least 95% of all ruptured disks are in the 4th and 5th lumbar joints. The remainder involve the curved portions of the cervical and thoracic areas and the upper lumbar joints. It is therefore obvious that the outstanding symptom of the nerve element of the lesion is sciatica.

The usual history is therefore a low back injury or strain followed by low back pain. It is not continuous and is relieved by simple measures but recurs on exercise. Sooner or later it is followed by sciatica, usually in one leg, occasionally both, but again not continuous, though it may be extremely severe. There is one other striking and characteristic phenomenon, during the acute phase the pains are made worse by coughing, sneezing and straining at stool.

On examination the victim is usually obviously in pain. The more important and characteristic findings are based, as are the symptoms, directly upon the mechanics of the lesion. When the back is hyperextended additional cartilage is squeezed through the torn ligament by the approximation of the posterior surface of the vertebral bodies increasing the pressure on the nerve. Hyperextension therefore causes pain. For this reason the lower back is found flattened, that is the spine is carried slightly flexed for the sake of comfort. It is well demonstrated if the patient is made to lie on his back with the edge of the table somewhat above the knees so that the legs hang free. The resulting hyperextension of the lumbar area causes pain and the position cannot, as a rule be maintained.

Because the capsule is strongest in the midline, rupture usually occurs on one or the other side. The sciatica is therefore most frequently unilateral. Just as hyperextension forces the cartilage against the nerve root, so lateral bending to the affected side increases the pressure and causes pain. The patient usually walks then, with a limp, listing away from the affected side. The failure of the affected portion of the lumbar spine to bend laterally can often be seen on examination. It should be sought for in the X-ray by having anterior and posterior plates made with the patient bending to each side as well as in the conventional straight spine position.

The Achilles reflex is abolished in approximately half of the cases and the disk will then be found at L 5 in most instances. Not infrequently disturbance of sensation in the lateral area of the foot will also be found and points to the same location. Pain in the thigh and a disturbance of sensation in that location point to L 3.

The amount of muscular involvment depends entirely upon the amount of damage the nerve sustains. It is usually not prominent but weakness of the leg is not infrequently a symptom and partial or complete parallysis does occur.

Lumbar puncture usually yields nothing worth while. The injection of lipiodol and of air have both been abandoned by most workers. While either media does outline many lesions neither can be expected to show the concealed type of disk. In approximately 60% of the proven cases intra-spinal contrast media has mislead by failing to show anything.

Dandy states that in his series 95% of the patients seen with "Low back pain plus sciatica down the back of the leg and occurring in attacks" and with accentuation of .the pain on coughing and sneezing during the acute stage, have ruptured disks. The other 5% being caused by (1) Spondylolisthesis 2%. (2) Congenitally defective fifth lumbar vertebra 2%. (3) Caudal tumor 1%. A Roentgenogram will diagnose or eliminate all but the caudal tumors. Whether or not his findings will be corroberated by others remains to be seen but his series is very impressive and commands respect.

Narrowing of the intevertebral space that can be recognized by X-ray occurs only after the lesion has existed for sometime. It does localize it quite accurately however. As mentioned before the failure of a vertebra to tilt on lateral bending is a diagnostic sign that should be sought for in the X-ray.

It is well to remember two disks are found ruptured in about twenty percent of the patients.

The history, distribution of the pain, Achilles reflex, local tenderness over the spinous process, Roentgenogram and, at operation, abnormal mobility of the vertebra, lead to great accuracy in the localization of the disk involved. Abnormal mobility of a vertebra is demonstrated at operation by exerting sudden pressure upon the spinous process. If

the joint is normal there is almost no movement in the vertebra tested.

The frequency with which ruptured disks occurs and the percentage of spontaneous cures are both as yet unknown quantities. It seems entirely probable that ultimately the frequency will prove to be high. It is possible that some disks never cause sufficient disability to make the individual consult his physician. The precentage of spontaneous cures may similarly turn out to be higher than is now thought. If the amount of damaged cartilage is small and the tear in the capsule large practically all of the damaged tissue might extrude into the peridural space where absorption probably can occur leaving very little in the avascular joint area. A spontaneous cure is conceivable under these conditions.

It has been shown that in over half of the cases, the capsule bulges and either does not tear or tears only very slightly, the so-called concealed disk. A large portion, or all, of the damaged tissue is then retained within the joint where absorption must be exceedingly slow because of the paucity of the blood supply. Renewed insults to the joint could hardly be avoided. In these patients it would therefore seem that recurring bouts of backache and sciatica are almost inevitable, however long the interval of comfort might be in occasional instances. The frequency with which this situation is found, 60% or more of the cases, has led a good many to the opinion that once the existence of a ruptured disk is definitely established, operation is indicated. It is then only in instances where the attacks are so mild that they do not interfere with the normal life of the patient that operation is deferred. This is a very strong position and one which the profession as a whole will ultimately adopt in all probability.

In the operation the removal of only a small notch of bone from the lamina of the vertebra above the disk, as a rule, gives sufficient exposure. A portion of the ligamentum flavum is then removed and the nerve is uncovered. The nerve practically always adherent to the surrounding structures and must be freed before it can be displaced and the protruding disk seen clearly. The necrotic extruded cartilage looks like a small mass of crab meat. In the concealed disk the bulge is not prominent but the capsule feels much softer than normal and gives a sense of fluctuation to the touch with an instrument. On one occasion I clearly saw free fluid in the capsular tissue. Incision of the capsule permits the escape of both fluid and necrotic cartilage.

After the removal of the necrotic cartilaginous mass proceedures differ widely. Some operators simply close the wound forthwith. Others think that a spinal fusion is essential and do some type of spinous process fusion.

Still another group believe it necessary to curette away as much of the diseased cartilage from within the joint as can be removed. When this is thoroughly done the cartilage plate is also removed leaving the bone exposed and bony spicules free in the curetted cavity. Bony union between the vertebral bodies follows. Such complete removal of pathological tissue and vertebral body fusion is strongly advocated by Dandy. The elimination of pathological tissue is sound in any condition and the internal fusion of joints involved in an otherwise incurable traumatic arthritis is a well recognized proceedure. If the internal fusion of the veterbral bodies is deemed insufficient the cartilage of the facet joint is easy to remove and its subsequent fusion will further stabilize the vertebrae. Casts are not needed when these proceedures are adopted. Recurrence as reported in the literature ranges between 5% and 10%. This should be markedly less in curetted cases.

Except when fusion of the spinous processes is done the patients remain in bed from seven to ten days. They need a light brace or canvas corset for three or four months and should not return to heavy work for that length of time.

The mortality is less than one-half of one percent. Complications are most often the result of nerve damage caused either by the pressure of the extruded cartilage or the operative manipulation. Weakness of the muscle of the leg may follow but fortunately disappears in a few weeks in almost all instances.

Relief from the sciatica pain is usually dramatic, the patient most often being free of this on recovery from the anesthetic. The back, however, as one would expect, is sore and sensitive for several weeks. Patients should never be led to expect a perfectly normal back for the operation is inherently a destructive one from any viewpoint except that of the nerve elements. The proper mental preparation of these patients and their guidance after operation is a prime necessity.

It must never be forgotten that the picture presented by a ruptured disk is duplicated by any lesion which produces the same mechanical conditions. Spondylolisthesis and other bony defects give the identical picture here outlined but their presence can be recognized by X-ray. Cauda equina tumors have already been mentioned and they can be diagnosed by a careful history and thorough physical examination. It was the finding of the cartilage in suspected cord tumors that led directly to the recognition of the ruptured disk. Tumors of the sciatic nerve itself and true inflammation of the nerve should cause only momentary confusion. Similarly there are numerous muscle and ligament disabilities which may resemble the ruptured disk but with these the pain is almost never recurring. On the other hand, as with most clinical entities, there is sufficient individual variation to at times suggest other conditions. This is especially so when severe symptoms immediately follow the injury and

we are without the benefit of the story of the recurrence of the pain following a fairly free interval.

In summary therefore, the ruptured disk is a clinical entity. It is essentially a traumatic arthritis. The type of treatment depends upon the severity of the symptoms and the frequency of their recurrence. Surgically the results are excellent in even reasonably well selected cases. Occasionally operation is an imperative necessity if permanent damage to important nerve structures is to be avoided.

The frequency of complete spontaneous cure has not been determined but in clinically recognizable disks it is probably very low.

The pain is due to two factors. The necrotic material in the joint causes the backache while pressure of the extruded cartilage upon the nerve produces the referred pain or sciatica.

Both in the diagnosis and the localization the percentage of error should be small.

Complete curettage of the joint is highly desirable. It not only removes pathological tissue but it also produces an almost ideal type of fusion. In addition reduces the percentage of recurrence and the period of disability.

Spinal injections of contrast media are contraindicated.

The so-called "concealed disk" occurs more frequently than the frankly protruding one. Two disks are present in approximately 20% of the patients.

Operation is indicated when the patient is having sufficient trouble to interfere with his daily life.

Diagnosis before pressure on nerve elements causes symptoms is as yet not possible.

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DISCUSSION

DR. J. W. WHITE: (Greenville)

"There are points in this important subject that I feel need stressing. If a destructive agent has attacked the intervertebral disc sufficiently to allow some of its material to escape, the hydrostatic force that supports well over half of the weight of the body has been impaired and the normal physiological action of this structure has been permanently injured. It is closely comparable to our riding on an underinflated or actually flat tire. I see absolutely no way of getting around this all important mechanical situation except to join together the vertebrae between which the trouble exists. This procedure by a surgeon, properly equipped to do this work, requires no more than fifteen or twenty minutes and the greater assurance of a more permanent result makes it well worth the extra trouble. It makes no difference whether this operation is done by a general, neurological or orthopedic surgeon except that that surgeon, after doing this procedure, recognizes his obligation to follow these cases through for years. He must not be satisfied with the result obtained in the first six months or so.

This disc operation has been too frequently condemned because of the extravagant claims made by over enthusiastic surgeons who follow their cases only a few months barely beyond their acute convalescence. The insurance companies are still far from being satisfied with the results in their series of cases.

I feel strongly that it is up to the surgeon who does these operations to do a permanent reconstruction job at the time he does the relatively minor procedure of giving immediate relief. With a successful fusion a patient can be expected to go back to heavy physical work and not be required to change to a more sedentary and less remunerative occupation but not in a few weeks.

An extensive investigation of this subject is now being conducted in our armed forces where the operation has been done by competent surgeons. It will not be long before complete reports will be released.

The other point that must be stressed is that many cases, showing typical disc symptoms get well with conservative treatment, such as regulation of activity, general supportive treatment and last, but not least, proper mechanical use of the back. In our evolution we have come far, but our back was not designed for vertical locomotion and is the most vulnerable part of our complicated machine. The surgeon who sees these cases and advises operation is almost as obligated to follow those cases through who refuse operation (and there are of course many) as those he operates on."

The final word has not been said and I am certainly glad this discussion has been brought up this afternoon.

DR. E. R. DAWSON, Jr.: (Florence)

I enjoyed Dr. Doughty's excellent presentation.

It has been four and one-half years since I had a spinal fusion for my ruptured intervertebral disc. Several doctors are among the ruptured intervertebral disc cases I have studied. Some have been operated upon—some have not. My conclusions are:

1) Less than one case in five of ruptured intervertebral disc needs surgery.

2) Of the non-surgical procedures, I have found paravertebral injection to be the most dramatic and successful in the relief of pain (30 cc. of one-half percent novocaine injection in ruptured disc area). It is surprising to note the number of cases where the relief lasts for an extended period.

3) The great majority of cases requiring removal of the ruptured intervertebral disc should also have

a spinal fusion. The Hibbs type of fusion is best; i. e., the joint cartilage is removed and the spines and laminae are fish-scaled. I obtain extra bone for grafts from each posterior-superior spine (through the same mid line incision), and prepare it as 1/4 inch chips. These small medullary chips are incorporated into one fusion mass more quickly than large cortical grafts.

4) The truth concerning ruptured intervertebral discs will be arrived at only by meticulous follow-up and detailed study of cases.

DR. JAMES McLEOD: (Florence)

It has been my privilege to have heard a number of papers on ruptured intervertebral discs. I have heard the subject presented by Dr. Magnuson, and also Dr. Dandy and a number of other people. However, the presentation of Dr. Doughty is in my opinion the finest that I have heard, and I wish to congratulate him on the manner in which he has handled the subject.

It has been my personal misfortune to have had almost yearly attacks of "lumbago" for the past 30 years, following a football injury. This was climaxed about one year ago with a terrific attack of sciatica, and for a period of 10 days I was unable to extend my left leg. I was diagnosed "ruptured intervertebral disc" and was operated upon by Dr. Dandy. My immediate results were fine, in that all of my sciatic pain was relieved. I have had some trouble with my back since then, but it is in good shape now.

I should like to emphasize that a ruptured intervertebral disc is a clinical entity, and should be recognized as such. These cases should be treated conservatively, if possible, and I am not in a position to say what percentage should be operated upon. People with low back pain, that is accompanied by sciatica, which is exaggerated by sneezing and coughing surely do not always call for an operation.

I do not think that air or lipiodol should be injected into the spine of these cases, for the purpose of diagnosis. The condition is a clinical entity that can be recognized without such procedures.

CAPTAIN HARRY E. BELLER, M. C.: (Fort Jackson)

I wanted to ask Dr. Doughty what his experience has been with the incomplete laminectomy approach he uses for the herniated intervertebral discs, in diagnosing or suspecting at the operating table, such other pressure factors as extra-dural tumors, particularly when there is no clear clinical picture of the cause of this pressure.

My other contribution to this discussion is upon the value of an opaque medium in the spinal canal. I have seen the use of 'Pantopaque' as a very valuable adjuvant. The last case I saw had the clinical signs of a disc protrusion at the left 5th lumbar interspace. The myelography with Pantopaque revealed a defect at the fourth lumbar interspace on the right. This was confirmed at operation when two herniated intervertebral discs were found.

Such a non irrating medium, I believe, will prove valuable in many obscure cases, and also will avoid some of the disappointments encountered in our diagnosis and treatment of this condition."

DR. A. T. MOORE: (Columbia)

I hesitate to make any discussion, I am sorry I missed Dr. Doughty's paper. I can't discuss what was said. This subject is so interesting I couldn't refrain from getting on my feet, as I gather from the discussion of this paper he has brought out the subject in a very admirable way and has emphasized the conservative attitude towards this comparative new lesion. I was glad to hear Doctor McLeod say it is a clinical entity. I listened to the other discussers and I gather everyone realized that we should be very conservative in our approach to the problem. It is full of danger and hazards that is the only reason I got on my feet is to emphasize that point.

I don't know if you gentlemen know it but since this business has started I became interested in it about eight years ago, and I have been doing these cases for the past eight years, altogether approximately 75 cases. It is a small experience but enough to know the seriousness of it; enough to know that one has to be very very careful in his evaluation of a case and must be very careful in the treatment that is undertaken because there are many many problems that do present themselves at the time of operation.

Captain Beller just mentioned a point there about the diagnosis with opaque media. I think that must be in certain cases necessary and in the clinic, in Rochester, they do use it in a small percent of the cases.

I don't think we should look on this problem as something simple and something easily diagnosed, and it doesn't take a spinalgram. In other words, a careful diagnosis is needed, and in a large percent of the cases they can recover with conservative treatment.

That about summarizes the point I had in mind.

DR. DOUGHTY: (Closing the Discussion)

I will try to answer the discussors questions but first I want to say that I deeply appreciate the discussion. I want also to say that Dandy has been misquoted more than almost any one I know of and I shall try to quote him accurately. He says that a disc was the cause in 95% of his cases with low backache, with pain down the back of the leg, occurring in attacks and the pain made worse by coughing and sneezing during the acute phase of the condition. The words may not be accurate but the sense, I am sure, is accurate. The other 5% is made up of 2% spondylolisthesis, 1% caudal tumor and I can't think for the minute of the other; oh! yes, 2% congenital defects of the fifth lumbar vertabra.

All of these are recognized on X-ray examination of the spine except the caudal tumors.

The objection to contrast media is that over 60% of all discs are the so-called concealed discs in which there has not been a true rupture. I have seen oedema in the deep tissues of the capsule so that you could see the fluid move about when you punched on the capsule. It is a true lesion. These will not be shown by contrast media and if 60% of the patients are in that boat you will find the contrast media will mislead you and add difficulty rather than helping.

Indications for operation; I think when a person has had definite recurring attacks, operation is indicated. There are some in whom operation is imperative to prevent permanent nerve damage, as I mentioned, and you can't wait on recurring attacks in that individual without sacrificing the nerve unnecessarily. These are rare; few and far between.

The operation is inherently destructive, it destroys a joint. The only constructive element is relief of pressure on the nerve. I want to mention that in the operation it is imperative to free the adhesions between the nerve and the ruptured disc in order to relieve the pain. These patients have a local backache for a long time, they don't have a normal back. The joint in the back is gone if you do a spinous type of fusion or if you destroy it by removing the cartilage plates and leave bony spicules between the bones. I believe bony fusion does occur when you remove as much cartilage as you possibly can. You admittedly can't get it all but you can get a whale of a lot of the cartilage plates. I believe a direct fusion of the joint is better than any bridge work you can put in by a spinous graft fusion. If you want to destroy any other joint you don't build a bony graft to one side of the joint as a sort of bridge and yet that is what a spinous graft does. The graft is then two inches from the joint and constitutes a bridge of bone around it. If you feel that you are dissatisfied with the completeness of the removal of the pathological tissue and don't think you are going to get a fusion of the joint it isn't hard to remove the cartilage of the facet joint and fuse it. I believe direct fusion of the vertebral joint follows thorough curettage but I am not certain that fusion is essential. I am sure complete removal of pathological tissue is sound practice.

The extra-dural tumors; I haven't thought of them. Frankly, I haven't encountered them. They do exist. They are quite rare but the fact that caudal tumors and extra-dural tumors in the spinal canal do occur is one of the reasons the neuro-surgeon says discs belong in the field of neuro-surgery and not orthopedic surgery. I am a general surgeon not a neuro-surgeon.

The mortality: less than one-half of one percent.

The recurrences; without curettage of the joint it ranges around 5% or 10%, as reported in the literature and it approaches "0" with the complete removal of the pathological tissue with the curet, that is, as complete a removal as is humanly possible.

Headaches from Eye, Ear, Nose and Throat Standpoint

RODERICK MACDONALD, M.D., ROCK HILL, S. C.

Headache is one of the most prevalent ailments of mankind. This subject is an enormous one, and the preparation of this paper has entailed considerable study. Headache is one of the most common conditions of which patients complain, and in many instances, in order to determine its cause, we are led far afield, consequently, we feel that the first requisite for successful study of this condition necessitates a most careful and painstaking history, therefore, we are asking your permission to go beyond the confines of the subject to the eye, ear, nose and throat.

A great many patients first see the Ophthalmologist and in many cases he acts as somewhat of a filter in directing individuals in the proper channel. The diagnosis of the cause of headache is often very difficult, and consequently it is all the more reason for one not to confine his thoughts always to a limited field of endeavor. One has to think of many diseases which cause headache, for example, tumor of the scalp and skull, multiple myelons and inflammation of the larger vessels, mostly the temporal ones. Again, most of the upper respiratory conditions are initiated by headache. Quite frequently we see a long continuous headache in typhoid fever, malaria, and acute nephritis.

Often we see toxic headache with the administra-

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*Read at annual meeting S. C. Medical Assoc., Columbia, S. C., April 12, 1944.

tion of some sulphonamides. Hypertension is another extremely common condition, however, headaches associated with condition are most variable in character. Some patients having the worse types of hypertension never have a headache, yet patients having the milder ones complain bitterly. At this point, I might express my opinion that a thorough ophthalomoscopic examination is the only accurate indices to study hypertension from both a diagnostic and prognostic standpoint. Another extremely common condition that should be mentioned is migraine. Family history helps. We know that migraine attacts are precipitated by emotional states, food allergies, fatigue, infections, etc. One should not be mislead in studying intra-cranial disease since headache is not always the early symptom, therefore, all of us are aware of the need of early visual field and perimatric studies long before the Optic discs have shown any perceptive changes. Headache may accompany a brain tumor and is an early complaint. An intense boring type of pain is noted and one may have continuous vomiting without the pain being relieved.

With the rapid preliminary review we shall now try to stick more closely to the subject and study the headache related to the eye. It is universally recognized by the Ophthalmologist that in the organic disorders causing headache we find errors of refraction, accommodation anomalise, muscle inbalances, and glaucoma. The patients with refraction errors complain of burning, stinging and sandy feeling in the eyes. Photophobia is also a cause of headache. From an Anatomical standpoint we know that four of the cranial nerves go directly to the eye and three other cranial nerves have distribution to the eye. The fifth cranial nerve has wide connection with the mid-brain, extends down to the second cervical level, and also is connected with the muclei of the other cranial nerves. Hence, these connections cause different types of headaches. In Glaucoma sometimes the headache is extremely insidious, and at first is localized in the eye ball. As the pressure on the eye ball increases, it radiates over the entire area supplied by the Ophthalmatic division of the tri-gennal nerve. Changing of the position of the head may make matters worse. This type of headache is perhaps worse with a rapidly growing tumor, but the location of the headache does not help in diagnosing the position of the tumor.

Another type of headache is the so-called psychogenic. The symptoms of which, when no organic condition has been found, may be terrible pains in the head having no particular location and being most variable as to when they occur. Frequently, these individuals are under going some unpleasant experience or some mental disturbance. When adequate adjustment of the situation has been made, the headache disappears. All of us, or most of us, are familiar with Tri-geminal neuralgia with the trigger zones and the paroxysms of pain located in the same areas. We have already briefly covered the so-called allergic headache. Fair results have been accomplished by the administration of Ergo-Tamine Tartrate. We should not overlook changes in the pituitary gland. We should also think of the thyroid gland and Addison's Disease.

Glaucoma should always be thought of and looked for, because those of us who do eye work see many eyes hopelessly damaged as a result of patients having fallen into the hands of poorly trained individuals, and it is rather surprising that, even now, we hear of our medical colleagues referring patients to non-medical refractionists. Any physician, who has seen a case of acute glaucoma with its sudden onset and associated nausea and vomiting and intense pain, steamy cornea marked with visual loss, has ever stamped on his mind an unforgetable picture. In chronic glaucoma and secondary glaucoma there may be a neuralgic type of pain confined to face, cheek, and temporal areas. This may be mistaken for sinus infection until visual loss becomes noticeable.

A great many people complain of a disturbance from glare. This however, is not as important as commercial advertisers would lead us to believe. There is a rare type of Ophthalmic migraine which is caused by glare, but this condition has other associated symptoms such as ocular paralysis, particularly that of the third nerve, and it is most variable in its time and length of disturbance. All of us know that in iritis the pain is much worse at night. This type of neuralgia is usually referred to the forehead.

Retrobulbar neuritis causes pain deep in the orbit and is worse when the eye is in motion. We should also mention headaches in orbital tumors and exophthalmous. All of us are aware of the headache which we see in refractive errors. They are particularly present in early presbyopes, and in individuals suffering from hyperopia and astigmatic errors.

Refractive defects are frequently brought to a patient's attention by some concomitant condition such as over-study, illness, or some physical condition. As previously mentioned, most of the eye pains are noted along the path of the first division of the fifth nerve, however, there are various reflect pains that are induced by spastic conditions of the head and neck muscles. We know that after a hard day's work, the eye feels tired which sensation is the result of over-action of the Ciliary muscles. They are also due to the various muscular inbalances, both horizontal and vertical.

The frontalis muscle is inserted in the upper lid of each eye, and when the orbicularis contracts the frontalis does also which, in turn, pulls on the epircrania and muscles of the scalp thus setting up the above mentioned spasm, causing headache.

It is of practical interest to mention in muscle

surgery the cutting or pricking of the extro-ocular muscles which cause no pain or headache, but when traction is made on them the patient complains bitterly of both pain and headache. Another condition that has been widely written up in the lay press as a cause for headache is aneikosonia. Headache, from an ocular origin, is in most instances amenable to correct therapy which entails a thorough study of all the functions of the eye in a painstaking manner.

Now we come to what is apparently the most popular type of headache of which a patient complains, namely sinus headache. The public has been made sinus-conscious in the last three or four decades and this is still ably aided and abated by newspaper advertisements and the various radio broadcasts, for example all of us have heard, "When you have a headache, snap back with Stanback" and how many of us have seen the effects of this and similar drugs which are sold in some manufacturing plants from "dope wagons." All of these propriotary drugs contain bromides and acetanilid. When first taken, they will usually relieve headaches, but their continued use produces headaches and symptoms of poisoning. Many so-called "sinus" headaches are attributed to these drugs. Dr. Eagle of Duke University has recently contributed a most illuminating article on the abuse of such medication. We see many cases of individuals who have sinusitis of long standing and never complain of headache, likewise we see individuals with sinusitis and headache. The two are, however, not necessarily associated.

Of all the factors causing headaches perhaps 5% of them are due to sinusitis. Maxillary sinus headaches, most of which are located in the cheek and zygomatic regions and in the frontal sinus over the eyes. The Sphenoidal sinus usually causes temporal and vertex headaches. Infections in the ethmoidal air cells cause pain in behind and in the inner angles of the eye. Many experiments have been done to determine the exact factor involved in the mechanism of pain from the para-nasal sinuses. It is now generally conceded that there is little sensation in the lining mucosa of the sinuses.

Moreover, the pains are distributed along the first and second division of the fifth nerve. Some authorities associate headache with stretching of certain portions of the meninges and dilatation of some of the blood vessels and the middle meningeal artery. Congestion and inflammation of the sinuses cause disturbances in the above mentioned places, thus causing headache. It is generally conceded that the ostia of the sinuses are the place where sensation is located. The lower portion of the naso frontal duct and ostieum of the maxillary sinus are very sensitive. When the turbinal bodies become congested and swollen, the nose is stopped up and headache is usually at its height. The use of vasoconstructors is of immense benefit. We have evidence that more and more accumulated infection in certain areas of the nose influences the location of a headache, for example, diseases in the upper nasal area, the headache is usually in front and top of head, whereas in diseases of the middle and inferior portion, we note headaches in the zygomoa, temple, teeth and jaws. The only exception being periapical infection.

In sinusitis when the individual lies down and rests, the headaches are much better. The nasal secretions are much less.

In frontal sinusitis the headache usually begins in the early morning after the patient arises and tends to diminish later in the day. Maxillary sinusitis is worse toward evening because its opening is higher than the floor.

Sphenoid pains may be noted in the vertex and temporal regions. Likewise in acute sphenoiditis, we note intense pain in the mastoid area, the mechanism of which is by way of the geniculate ganglion.

Vacum headaches in the past have been discussed at length. Today their occurrence is open to question.

Where the nasal cavities are constricted, inspired jets of air against the nasal ganglia produce headache.

While patients are under observation, one can give by mouth doses of a barbiturate with ephedrine which gives temporary relief, thus affording the physician more time for observation and study.

It is also surprising the number of headaches that are benefitted by thyroid extract even though the basal metabolic rate is not too low.

Unilateral headaches along the branches of the spheno-palatine ganglion has been confused with sinus headaches. Many mutilating sinus operations have been done and many useless dental extractions performed. Cocainization of this ganglion often leads to dramatic relief.

From an etiological standpoint, headaches offer valuable diagnostic points in certain ear conditions.

In adults, acute otitis media may cause diffuse dull headaches around the mastoid and deep in the ear. They are, however, usually mediocre and do not prevent sleep. Paracentesis usually relieves them. When they persist with a freely discharging ear and the pain radiated down the neck, one should suspect involvement of the lacteral sinus.

Pain in the temporal region localized in one spot usually points to involvement of the middle fossa.

Where the pain is noted constantly in one area, suspect an extra dural abscess.

Pain behind the eye on the same side as the involved ear may point to petrositis or disturbances secondary to collateral edema. When the sulphanamides are being used, they should be discontinued in order not to mask symptoms. None of the aforementioned headaches are a part of the ordinary acute otitides.

We have previously mentioned the confusion which may exist in differentiating between the diagnosis of sphenoiditis and the diagnosis of ear con-

ditions. Attic infections may cause vertex pains.

Occipital headaches are not caused by the ear, but they usually point to cerebellar abscess. Generally speaking, the chronic types of otitis do not cause headaches until the tegmea is infected and neurotic. Pain in the mastoid in chronic cases generally points to intra cranial involvement.

Lastly we should never overlook the naso-pharynx. This is perhaps one of the most neglected areas in the human body. Occasionally we see patients with headaches, plus diplopia, dysphagia, and facial pains due to involvement of the sixth, ninth, and fifth cranial nerves when the final diagnosis is made it is carcinoma of the naso-pharynx.

In conclusion, we must remember that headache is a subjective symptom, therefore, it is difficult to accurately evaluate from the literature. Many authors are its victims and tend to tinge their writings.

A Suggested Method of Treatment for Acute and Chronic Infections of the Middle Ear

R. W. HANCKEL, M.D., CHARLESTON, S. C.

The present status of the treatment of acute and chronic infections in undergoing tremendous changes. This paper will deal only with the present day treatment of acute and chronic infections of the middle ear, or more specifically acute and chronic purulent otitis media.

Now that the sulfonamides are with us and with newer and perhaps better therapeutic agents just over the horizon, we may as well face the fact that surgery of the middle ear and mastoid, insofar as acute infections are concerned, will be confined mostly to myringotomies. It is true that there are still present in many individuals chronic purulent infections of the middle ear and mastoid which do and will continue to present indications for radical or modified radical mastoidectomies. However, the percentage of simple mastoidectomies now required have been so markedly reduced by sulfonamides that it has caused many a hospital resident in otolaryngology to bemoan the fact that there are so few indications for this procedure that the technic of the operation can scarcely be learned save on the cadaver. When the present group of chronic cases has been operated on, I dare say that surgery on the mastoid for acute and chronic infections will become a rarity.

The following method of dealing with infections in the middle ear was evolved over a period of several years from the combination of several procedures as suggested by different authors.

In those cases where pain and fever are not urgent symptoms and where the drum is inflamed, but bulging is not a prominent feature, i. e. those cases where the infection is not of sufficient severity to warrant myringotomy, the patient is simply put on sulfadiazine in the appropriate dosage, the total divided into 6 doses and each dose administered every 4 hours with 5 to 10 grains of sodium bicarbonate to protect the patient from a possible acidosis and to promote excretion. In addition some glycerin compound which will promote a reduction of the fluid in the middle ear by osmosis through the drum is prescribed and the patient directed to drop several drops, previously warmed, into the affected ear every 2-4 hours, and to place a pledget of cotton in the outer canal afterwards. Nasal congestion being an almost constant companion of this condition some type of nasal vasoconstrictor is advised. For several years the author used ¼ % sol. neosynephrin. Since the advent of the use of sulfonamides locally in the nose, the author at first tried the above mentioned vasoconstrictor followed in a few minutes by a few drops of a 5% solution of sodium sulfathiazole in normal saline. However, the sodium salt soon fell into disrepute because of its irritative properties and a change was made to a sulfathiazole suspension in combination with a vasoconstrictor. More recently desoxyephedronium sulfathiazole as advocated by Turnbull et al[1] has been tried with good results. In any case, no matter what solution is selected the patient should be instructed to instill several drops in each nostril while lying on the back across the bed with the neck extended, and after the drops reach the nasopharynx, to lie on the bed on the side affected to produce shrinkage of the Eustachian orifice and tube. This should be repeated every two to four hours. Sedation may be accomplished by aspirin alone or in combination with codein in the appropriate dosage. If this method of treatment is carried out the patient will usually recover completely in two to seven days, and it is a very rare case the requires myringotomy.

In those cases that require myringotomy (i. e. where there is considerable pain, fever and marked

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bulging of the drum) the following procedure is also used. In from 24 to 48 hours after the myringotomy the patient returns to the office. If a child, he is wrapped in a sheet and lies on a table; if an adult, he simply sits in a treatment chair. The canal of the ear affected is cleansed with hydrogen peroxide 3% and dried with cotton tipped metal applicators. Then with the head turned so that the affected ear is up, the canal of this ear is filled with desoxyephedronium sulfathiazole solution warmed to body temperature. At first argyrol 10% was used, then when sodium sulfathiazole became available this was used in 5% strength; the first mentioned solution is favored at present because 1st, it is non-irritating; 2nd, it acts as a vasoconstrictor; 3rd, it is an excellent antiseptic agent.

A Siegle otoscope is then fitted snugly into the ear canal and alternate suction and pressure applied by means of the attached rubber bulb. The resultant effect is similar to that produced when the Proetz displacement method in nasal therapy is used. The hand bulb is usually compressed and allowed to expand three times. Frequently the solution is forced through the Eustachian tube into the nasopharynx.

This method of local aural therapy was suggested by W. Ogilvy Reid in 1939.[2] At that time a freshly prepared 10% solution of argyrol was the antiseptic agent used. Reid's paper reported 62% of cases of otorrhea cured when treated by this method. A total of 116 cases were reported. A cure meant that a dry ear was the end result.

The writer has used this method of treatment of otorrhea of all types over the course of the past 4 years, changing the antiseptic solution as discoveries progressed. The results have been uniformly good, but are much more striking in the acute infections than the chronic.

Specifically this method of treatment has been used in the following types of conditions:—

1. Acute purulent infections of the middle ear when there is an opening in the drum whether the origin of the opening is a spontaneous rupture or a myringotomy.

2. As a post-operative adjunct in those cases of simple or modified radical mastoidectomies where there remains a persistent otorrhea.

In post-operative radical mastoidectomies a combination of sulfanilimide, sulfathiazole and sulfapyridine powder in equal parts is simply sprayed through the enlarged canal opening on the operative site at regular intervals as indicated until the area becomes completely epithelialized.

Incidentally, after the desoxyephedronium sulfathiazole solution has been forced into the middle ear with the Siegle otoscope, the canal is dried with cotton tipped metal applicator and some of the above mentioned powder is insufflated on to the drum.

3. Chronic purulent infections of the middle ear where there is no evidence of intracranial or blood stream extension. In these latter cases it is sometimes possible to get a complete cessation of the discharge and not infrequently the opening in the drum membrane will close spontaneously. Where there is no inclination to spontaneous closure, this can sometimes be brought about by a procedure suggested by Stinson.[3] This consists of touching the edges of the perforation with a finely wound cotton tipped applicator dipped in trichloracetic acid crystals which have been allowed to deliquesce. Several days are allowed for the reaction to subside, then a "patch" of Cargyle's membrane cut about 25% larger than the perforation is picked up on what is a moistened cotton tipped applicator and placed over the perforation. If this does not become displaced, it is allowed to remain in place until the perforation closes which may take from 1 week to several months. If the "patch" becomes displaced, the procedure should be repeated.

In those cases where a dry ear does not result even after 6-8 months of treatment at weekly intervals, the in all probability one is dealing with a cholesteatoma. These cases should be watched carefully and studied with X-rays and if indicated a radical mastoidectomy should be done.

The following record includes only those private cases treated during the past three years:

Acute purulent otitis media:—

Total cases: 34

Number of cases cured (i. e. discharge stopped and perforation closed) 32

Number of cases improved (i. e. discharge stopped, but perforation remained open) 2

Chronic purulent otitis media:—

Total cases: 40

Number cured (i. e. as above) 6

Number improved (i. e. as above) 26

Unimproved: 8

Total number of cases: 74

Total number cured: 38

Total number improved: 28

Total number unimproved: 8

On a percent basis this would be:

Cured: 51%

Improved: 37.5%

Unimproved: 11.5%

Total percent cured and improved 88.5%

This shows a 26.5% improvement on the cases reported by Ogilvy Reid where argyrol alone was used. I dare say that this improvement would have been even greater had all of the cases in this series been treated with a solution of one of the sulfa derivatives. As indicated, agryrol was used at first and it was only in the past year that a sulfonamide solution was employed.

Summary: A method of treatment of acute and chronic middle ear infections which seems to surpass previous procedures is reported. It consists of forcing a sulfonamide solution into the middle

ear by means of a Siegle otoscope fitted snugly in the external ear canal.

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BOOK REVIEWS

CHEMOTHERAPY OF GONOCOCCIC INFECTIONS

Russell D. Herrold, M.D.,
The C. V. Mosby Company

This monograph is, in the words of the author, an attempt to "bring up to date all the data that have proved of value in the management of these infections through the avenue of chemotherapy," and is based upon reports in the literature as well as upon the author's personal experience with over eighteen hundred cases.

NEW AND NONOFFICIAL REMEDIES

1944; A. M. A., Chicago, Ill.

There are four general methods which a physician may adopt in his attempt to evaluate the great number of drugs and preparations which are appearing on the market.

1. He may study the various journals which describe experimental work and draw his own conclusions as to the value of new preparations. Such a method may be ideal but it is so time consuming and requires such a vast library that it is out of the question for the practicing physician.

2. He may attend medical meetings and listen to papers, consult with various leaders in the specialties, and secure opinions based upon experience. Such a method is of value but is extremely limited in its scope.

3. He may listen to the sales talk of a detail man. Many of these representatives of the larger companies are high type, honest gentlemen who are well informed as to their products and they render a valuable service in giving information. It must be remembered, however, that they are selling a product and that they would not be human if they were not a little biased in favor of their own preparations.

4. He may secure a copy of New and Nonofficial Remedies and consult it for a fair, scientific appraisal of the drug or preparation under consideration and prepared by workers in given fields under the general supervision of the A. M. A. Council on Pharmacy and Chemistry. Such a method is both scientific and safe, and we commend it as the method of choice.

PRACTICAL MALARIA CONTROL

Carl E. M. Gunther, M.D.; Philosophical Library, New York

Written as a Handbook for Field Workers, this volume should be of interest to any physician interested in or concerned with public health phases of malaria control. It is based upon the first hand experience of the author as the medical officer for many years of a large industry in the Mandated Territory of New Guinea.

MINOR SURGERY

Edited by Humphrey Rolleston and Alan Moncrieff
Philosophical Library, New York

This little volume consists of eighteen chapters each dealing with some phase of minor surgery (minor wounds, sprains, the hand, bursae and ganglia, skin infections, etc.) and each written by a British surgeon. It presents the latest thought of British medicine in the field of Minor Surgery.

TROPICAL NURSING

A. L. Gregg, M.D.; Philosophical Library, New York

This book deals with various diseases which occur in the tropics and special information regarding nursing care. It is a volume which should interest any nurse contemplating work in tropical countries.

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WE HAVE STARTED

After several months of preparation, the Ten Point Program of the South Carolina Medical Association was officially inaugurated on the first of September. Although the goal of the financial campaign had not been fully met, the Council, at a special meeting in August, decided that to wait longer was to invite serious delay in work which should be done this fall and winter.

Mr. M. L. Meadors of Florence was appointed Executive Officer and he will work with and under the direct supervision of the Council and Secretary.

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Through the years, the physicians of South Carolina — individually and collectively — have rendered yeoman service to the people of the state. The Medical College, the State Board of Health, the splendid hospitals scattered throughout the state, the general reduction in mortality rates, the rapid reduction in infant and maternal mortality rates, the various institutions for specialized medical care —all of these bear silent testimony to the persistent and untiring work which physicians, individually and collectively, have done through the years. But all too frequently, the work has been accepted by the people as a matter of fact and due credit has not been given to those who made all this possible. Nor has the public been made to realize that such accomplishments did not come through sudden chance but rather through careful thought and preparation by those whose training and experience made them the ones who were best acquainted with the problems involved.

During the past two decades there has arisen a growing consciousness of the obligation which our government owes to its citizens in the broad field of social security. Recently, this thought has concerned itself with providing better medical care for our people — and rightly so. Physicians — individually and collectively — have always wanted to provide better medical care for the people, and are ready to join in any forward move to promote this end.

There are those, however, and their number is not few, who believe that the best method in which to accomplish this purpose is through a federalized form of medical care — a paternalistic system of medicine, so to speak. With this thought we are in sharp disagreement.

This nation has grown to what it is because of the intrinsic principles of personal initiative, individual effort, and individual freedom of action. In dictator and fascist nations, the few have told the many what to do and how to do it—but that has never been the American way. Under the stress of war, the American citizen has been willing to forego certain of these liberties which have been his heritage, but once the war is over and peace has been estalished, he will reassert himself and cast aside the yoke under which he is now living.

These selfsame principles have applied and still apply in the field of medical care. The average citizen has always had the right to have the physician and the hospital of his own choosing without being told how or when to secure the medical care which he needs. At times he has been in need of financial aid in the securing of this medical care and provisions must be made to see that that aid is forthcoming — but it must be rendered in such a way as to maintain his self-respect and to insure his independence of action.

The physician, as Dr. Walter Judd has aptly said, is trained to be autopsy-minded. Casting speculations and theories aside, he is not satisfied until he knows just what caused a specific condition or series of symptoms. Once he has found the exact cause, he discards all previous ideas and accepts the facts which are presented. As the physician in South Carolina looks to other countries where federal medicine has been adopted as the system of medical practice, he sees that the general tone of medical practice has deteriorated — and seeing, he does not want to see such a system invoked in this country.

The average physician is not politically-minded. Absorbed in his work with its long hours, he has been accustomed to devote his spare time to study, to being with his family, or to local community enterprises. He has been interested in all that goes on in the national and international field but has been content to let others fight the political battles and do the directing. Perhaps he has been somewhat remiss in his duty as a citizen, but his actions have been understandable.

Today, he sees political forces moving into that

TEN POINT PROGRAM
of the
SOUTH CAROLINA MEDICAL ASSOCIATION

1. Cooperation

To promote closer cooperation and better understanding between all groups and individuals concerned with providing and improving medical care for the people of South Carolina.

2. Political Control

To prevent political control or domination of medical practice or of medical education.

3. Study

To assemble and to amplify studies relative to the need and availability of medical care in each county of the state and in the state at large, and to publicize these findings.

To study all agencies in the state which are involved in the administration of medical care as to the type of work which they are doing and the effectiveness of the work which is being done.

To promote plans for providing or improving medical care where there is a need.

4. Care of Indigent

To prepare a uniform plan for the hospital care of the indigent, financed by public county funds, which may be used by individual counties or by groups of counties for their indigent sick, and to promote the general adoption of such a plan.

To promote the establishments of clinics in each county for the indigent ambulatory patients, financed by public county funds and operated or supervised by established hospitals or by the county medical society.

5. Hospital Insurance

To make voluntary hospital insurance available to all the people of the state and to promote the widespread purchase of such insurance.

6. Hospitals

To study the present availability and facilities of hospitals in the state and to promote the establishment of well-equipped and adequately-staffed hospitals in needy areas.

To establish through the State Medical Association standards for hospitals in South Carolina and to make public the names of those hospitals which meet these standards.

7. Group Health Insurance

To promote the establishment of group health insurance plans in all industries, large and small, in South Carolina.

8. Standards for Insurance

To establish standards for insurance companies selling hospital or group health insurance in South Carolina and to publish the names of those who meet these standards.

9. Medical and Nursing Education

To promote the securing of adequate funds and facilities for the operation of the Medical College of the State of South Carolina.

To promote advancement in nursing education and nursing care in the state.

To promote the establishment of a loan fund whereby worthy young men and women of the state who are financially unable to meet the strain of a medical education may be able to secure aid.

10. Education of the Public

To acquaint the citizens of the state with regard to the agencies and facilities in the fields of medical care, public health, hospital and industrial insurance, and to encourage the people to use them on a much greater scale.

phase of living with which he is so well acquainted from first-hand experience—the field of medical care. He sees the public being led by specious arguments to consider lines of actions which he does not believe are to the best interests of all concerned. Late, but not too late, he realizes that he must lend his voice and actions to the fight to preserve those principles which he honestly believes are for the good of his patients and friends as well as for the good of his own profession. He further realizes that this battle cannot be fought by merely defending his own little backyard, he must join in an aggressive and progressive fight to secure the necessary changes in the broad field of medical care without overthrowing fundamental principles which have made America and American medicine what they are today. Finally, he realizes that this is not his fight alone, it is a fight in which the welfare of every citizen is involved, and he solicits the help and encouragement of all individuals and organizations who believe in the American way of living.

These and other thoughts have permeated the minds of our members as we have started upon this Ten Point Program.

When the Council decided to put the Ten Point Program into effect on Sept. 1, Mr. M. L. Meadors was elected as Executive Director and will serve in that capacity for the coming year. We do not believe that Council could have made a better selection.

The son of a Methodist preacher, Mr. Meadors (known to his many friends as "Jack") was born in Rock Hill and spent the early years of his life in the Piedmont section of this state. After being graduated from Wofford (1924), he studied law and was admitted to the Bar in 1926.

He practiced law in Kingstree from 1926 to 1934 and then went to New Orleans for two years where

M. L. MEADORS

he was associated with the Legal Division of the Federal Trade Commission. While in Kingstree, he served as a member of the S. C. House of Representatives for a year and a half. For the past eight years, Mr. Meadors has been practicing law in Florence where he now makes his home. Recently, he served for six months as attorney for the O. P. A. office in Florence. He is married and has two children.

Mr. Meadors plans to give the greater part of his time to the work connected with the Ten Point Program although he will still retain certain legal connections which he now holds.

His South Carolina background, his legal training, his innate intelligence, his interest in civic affairs, his capacity for work, and his integrity combine to give him those qualities which will fit him for his work. His many friends throughout the state will no doubt be glad to hear of his new undertaking. The Journal extends to him a hearty welcome into the family of the South Carolina Medical Association, an offer of the services which this Journal can give in his new work, and the best of wishes in the performance of the task which he and the Association are now attempting to do.

PENICILLIN

Until unlimited quantities of penicillin are available for general use, it will be necessary to utilize that designated for civilian consumption with utmost economy. In the present state of our knowledge about the effectiveness of this substance, it would seem best to insist on hospitalization of the candidate for penicillin treatment to insure optimum benefit from regular parenteral dosage.

Penicillin is most effective against Gram positive organisms, both coccus and rod forms; a'most as effective against some Gram negative cocci; and of little value against Gram negative rod forms. In the enormous field of staphylococcus infections it has shown some of its most brilliant results. In this field, where the sulfonamides have proved relatively disappointing, penicillin has no peer. It compares favorably but is not strikingly superior to the sulfonamides in streptococcus, pneumococcus and meningococcus infections and works spectacularly in gonorrhoea.

With sulfonamides readily available and inexpensive, there is little reason to abandon them in favor of penicillin in those conditions where their effectiveness is on a par with the more recent drug. Naturally it is reassuring to have penicillin to fall back on in the event that unfavorable drug reactions develop from the sulfonamides or where the infecting organism has become resistant to these substances.

Among the *staphylococcus infections* where penicillin is indicated are osteomyelitis, carbuncles, staphylococcus bacteremia and the various complications resulting from rhinological infections, mastoiditis, sinus thrombosis, staphylococcus meningitis; also staphylococcus cellulitis. These infections should be hit early and hit hard, not only because of the malignant character of the infection but because of the tendency to penicillin fastness which staphylococcus alone among the bacteria is apt to develop. Many of the staphylococcus infections will require surgery as an adjunct to penicillin therapy. Not infrequently, as in early invasion of bone marrow in osteomyelitis, penicillin may make surgery unnecessary, but it should be regarded as an aid to general surgery, not a substitute for it.

Dosage of penicillin in staphylococcus infections may vary a little with the urgency of the condition but in general should be given plentifully and quickly, plentifully because the staphylococcus is the least vulnerable of all susceptible bacteria, and quickly so that penicillin fastness will not develop. From 80,000 to 100,000 units are given during the first twenty-four hours. For maximum effectiveness this should be administered by continuous intravenous drip but quite often this is impossible or impracticable. A very close second choice in the intramuscular administration of the drug every three hours in doses of 10,000 to 12,500 units for eight doses every twenty-four hours. The use of a total of a million units is not uncommon in severe staphylococcus infections but rarely do other infections require such heavy total dosage.

Streptococcus infections of unusual severity, especially when associated with bacteremia, are proper objects for penicillin therapy. Such conditions as puerperal sepsis, streptococcus pneumonia

and empyema, as well as mastoiditis and its compilcations due to this organism are successfully treated with penicillin. The total dosage to bring about recovery is usually less than in staphylococcus infections.

Pneumococcus infections respond well to penicillin. There is probably no particular advantage in using it in the ordinary lobar pneumonia. However, it is proving suprisingly beneficial in empyema when introduced into the empyema cavity daily in doses of 30,000 to 40,000 units diluted in 50 cc of sterile physiological salt solution. Combined with aspiration of all removable pus, this procedure not infrequently makes thoracotomy unnecessary. In cases of pneumococcus endocarditis, meningitis and sulfonamide resistant pneumococcus pneumonia, penicillin should be employed.

Meningococcus infections are probably best treated with the sulfonamides, but should such an infection fail to respond to them, penicillin should be tried. Penicillin does not reach the spinal fluid in appreciable amounts when given intravenously or intramuscularly. It must be given intrathecally if it is to be effective against any infection of the meninges. At present the accepted practice is to give 10,000 units dissolved in 10 cc sterile physiological salt solution intrathecally once daily after draining off as much spinal fluid as possible. From two to five such treatments, combined with the simultaneous intramuscular injection of 10,000 units every three hours controls the infection and the total dosage rarely exceeds 300,000 units.

Gonococcus infections respond in dramatic manner to a comparatively brief period of treatment with penicillin using relatively small total dosage. Six intramuscular injections of 20,000 units each at three hour intervals have been found adequate to clear up long-standing sulfonamide resistant infections in almost one hundred percent of the cases where it has been employed. It is especially indicated where there is any complication of the ordinary urethral infection such as arthritis, peritonitis, epididymitis, et cetera.

Syphilis in the early stages is apparently cured by penicillin. The total dosage is large — 1,200,000 units. There is no justification at the present time for using penicillin in late or complicated syphilis.

W. R. M.

NEWS ITEMS

Lt. Col. W. T. Barron is now located at the 164th General Hospital, Camp Grant, Ill.

Dr. M. R. (Dolph) Mobley of Florence has recently received a medical discharge from the Army. While in the service, Dr. Mobley performed a splendid job in starting the new rehabilitation center for the hard of hearing. He has been spending his time recently at Lake Junaluska.

Members of Council were distressed, at their last meeting, to hear of the death of the son of Dr. J. B. Latimer during a mission over Austria.

Major J. McMahon Davis is now in England.

Lieut. Eugene Guyton, recently returned from England, telling of meeting Captain Prentis Kinney on the Normandy beachhead on D day.

Dr. Eleanor Townsend, formerly of Charleston, has been commissioned a Lt. Commander in the Navy.

Dr. J. W. McLean, Greenville, has been recently promoted to the rank of Major. He is now in Italy.

Dr. James T. Quattlebaum has recently entered the service.

Pathological Conference, Medical College of the State of South Carolina

KENNETH M. LYNCH, M.D., PROFESSOR OF PATHOLOGY

ABSTRACT NO. 336

Student W. H. Hamilton (Presenting):

History: A 34 year old negro admitted on 8-26 with chief complaint of "swollen stomach." Nine months previously he developed fever, night sweats, flatulence and slight non-productive cough with dull epigastric pain following meals. His appetite became poor and he gradually began to lose weight.

Three weeks ago he noticed swelling of his abdomen which became progressively worse and produced marked discomfort together with some dyspnea. Weight loss increased and appetite vanished. He was nauseated during the week before admission and vomited on three occasions. He has been chronically constipated. No blood in vomitus or stools.

No history of contact with tuberculosis.

Physical examination: T-100.2. P-120. R-24. B. P. 110/70. Marked abdominal distention, dyspneic. Head negative. Chest expansion slight, but equal. Tactile fremitus impaired over the left base. Resonant throughout. Voice and breath sounds normal. No rales. Heart apparently normal. Abdomen markedly distended and well rounded. Does not move with respiration. No tenderness or rigidity. Tympanitic around umbilicus. Flat in flanks and above symphysis. Fluid wave present with shifting dulness. No peristalsis heard. No edema of extremities. No clubbing of fingers.

Laboratory Data:

Urinalysis — 2 plus albumin, in three specimens examined, no other abnormal findings.

Blood — 8-26, RBC 1,450,000, Hb, 48%; WBC 18,000, PMN 63%. Feces: No gross blood.

Course: Complained of discomfort in abdomen and had frequent loose stools during the first two days he was in the hospital. Had irregular fever up to 101.5. Two days after admission abdominal paracentesis was performed, trocar being introduced in the midline midway between symphysis and umbilicus. About 150 cc. of clear yellow fluid contained and then 350 cc. of greenish-yellow creamy pus. He was then transferred to surgery for operation.

Dr. F. E. Kredel (conducting): Mr. Nettles, what is your diagnosis?

Student Nettles: I think that tuberculosis is the primary disease to be considered. He may have had an active focus in the lung which resulted in spread to the peritoneum. An abdominal carcinoma with numerous peritoneal implants also has to be borne in mind. Amebiasis and some form of cirrhosis of the liver are the remaining diseases that I considered in the differential diagnosis. The presence of constipation and diarrhea made amebic infection a matter for serious consideration, but I do not believe that perforation of the intestine and abscess formation is a common complication. The yellow fluid seems to have come from the abdominal cavity and suggests portal obstruction due either to cirrhosis, carcinoma or liver abscess. I believe that tuberculous peritonitis is the most likely, however.

Dr. Kredel: Mr. Smith, do you agree with these suggestions?

Student Smith: I see no reason why it cannot be tuberculosis of the peritoneum, but the presence of clear and cloudy fluid are difficult to explain unless it was collected into separate locules or compartments. There is a remote possibility that an intra-abdominal cyst of pancreatic or mesenteric origin might be responsible for this picture, but I cannot substantiate this. The thick cloudy portion of the fluid that was removed may have settled into the dependent part of the cyst and obtained only when the upper layer of clear fluid had been withdrawn. I would certainly expect a hypochromic anemia with amebiasis as well as blood in the stools. Of course, it would be possible to have a small amount of bleeding over a long period of time that would produce an anemia of this degree.

Dr. Kredel: What color is the pus in an amebic abscess?

Student Smith: It has a brownish color like that of anchovy paste which is probably due to the old blood that is present.

Dr. Kredel: What do you think of the possibility of gastric carcinoma?

Student Smith: The epigastric distress, marked weight loss and hyperchromic macrocytic anemia are consistent, but I can't see any reason for the development of pockets of inflammatory exudate in the peritoneal cavity. I think tuberculous peritonitis the most probable.

Dr. Kredel: Mr. Fincher, are there any other examinations or laboratory aids that you would like to have?

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Student Fincher: I would like an X-ray of the chest and more detailed examination of the pus that was removed from the abdomen.

Student Hamilton: The fluid was described as a frankly purulent exudate. Routine culture was negative and guinea-pig inoculation was also negative. X-ray of the chest shows possible minimal apical tuberculosis and slight irregularity of the right dome of the diaphragm.

Student Fincher: That does not help a great deal, except that it makes me think less of tuberculous peritonitis and more of carcinoma of the stomach. What were the operative findings?

Student Hamilton: The intestines were inflamed, with pockets of pus and dirty grey fluid. There was a perforation of a loop of the small intestine. No tubercles were seen.

Dr. Kelley: I want to remind you that tuberculosis of the peritoneum cannot be judged by a plate of the lung as the source of infection is often in a lymph node. Now tuberculosis of the intestine may commonly be diagnosed from the state of the lungs, as the tubercle bacilli have to be coughed up and swallowed. The leucocyte count suggests some infection other than tuberculosis. Actinomycosis has to be mentioned and a more detailed examination of the pus should have been done. Carcinoma of the stomach is still an open question.

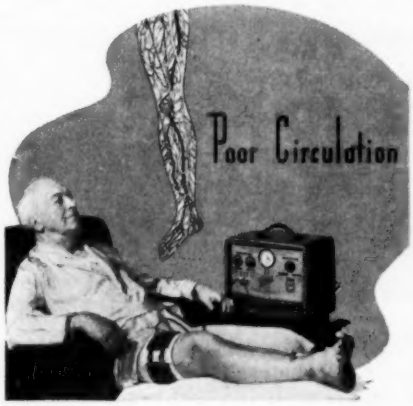
Dr. Kredel: Adequate examination of the feces are notably lacking here, so that amebiasis is still a possibility, although the operative findings are against it. The man still has a good chance of having tuberculosis. I would expect more induration and sinus and fistula formation with actinomycosis.

Dr. Pratt-Thomas: The final pathological diagnosis is: *Colitis, Chronic with Actinomycosis of Liver; Abscesses of Lung and Spleen; Peritonitis, Acute and Chronic; Perforation of Intestine (Spontaneous and Traumatic.)*

This case again illustrates the importance of the portal circulation in transmitting infection from the abdominal viscera to the liver. There was an extensive ulcerative colitis here. Although no actinomyces were found in the wall of the colon, these ulcerated and devitalized areas of tissue were undoubtedly the site of entrance of the organisms into the portal circulation and thence to the liver. The liver was riddled with irregular abscess cavities filled with greyish-yellow necrotic cheezy material. On microscopic examination numerous abscesses containing many typical ray-fungi were found. About the liver was a large irregular abscess cavity filled with pus which was due either to the penetration of the organisms either through the liver capsule or the hepatic flexure of the colon. There were also abscesses in the spleen and the lower lobe of the right lung, the latter due to extension of the suppurative process through the diaphragm. No actual colonies of organisms were found in these abscesses but they were most likely on the same basis. There was also an acute peritonitis due to the recent perforation of the intestine.

Dr. Kredel: This case illustrates the importance of tissue biopsy in any questionable lesion.

Dr. Kelley: As a somewhat academic point it should be mentioned that actinomyces do not belong to the usual class of fungi, but in the group where the higher bacteria and fungi merge. They do not grow on the ordinary media used for culturing fungi.



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CORRESPONDENCE

POST-WAR MEDICAL PLANNING

TO THE EDITOR:

The editorial in the August number of *The South Carolina Medical Journal* entitled "Straight Talk" while provocative of serious thought should give no one the jitters. It will be recalled that this editorial presented an extensive quotation from a letter of a medical officer in the Navy to the editor of *The Nebraska State Medical Journal*. It is stated that this officer is 42 years of age and that he gave up a large city practice early in the war to enter the service. He has now been in service about two years. He states that he has discussed post-war medical problems with something over 100 fellow officers and he implies that his own attitudes and questions and theirs are about the same. He then propounds nine questions, and states, "More and more the men in the service are expecting definite answers to these vital questions. The on y really satisfactory answer can be a concrete plan, submitted soon, and not when the end of the war is in sight. If such a satisfactory scheme fails to appear before peace comes, the service doctor will be forced to support (if not actually to foster) some politically controlled form of medical practice. There appears to us to be no other way to protect what we consider to be our rights."

It is these nine "vital questions" and the doctor's thinly veiled threat that I propose to discuss in this communication.

It should be noted first that the officer is now in his forties and that he had already built himself a large practice in the city. In those respects, he is not largely representative of the services medical officer group. Many of these men had been in private practice not at all or only for a relatively short time, and did not have large practices at the beginning of the war, and many of them came from small towns and rural communities rather than from cities.

Those men who had not already established practices before the war will be in no less favorable position when they return than they would have been had there not been a war, with perhaps, these exceptions: they will be older and they will have from the beginning more competitive beginners seeking to establish themselves. To counteract this, many will have saved some working capital where they had none before, and many will have acquired some specialized skill by reason of their war service. It is my feeling that many medical officers will plan to set themselves up as specialists either without or after further preparation. It is my further belief that many older general practitioners who have remained at home, will plan, as a means of escape from the strenuous life of war days, to specialize either without or after further study.

The officers who did have established practices and who elect to return to them, will, I feel, not have too great trouble reestablishing themselves except those in two categories. Those who come

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back and demand as a right that their patients return or be returned to them will certainly not gain anything by such an attitude. Patients do not and never have belonged to or been possessed by their doctors, nor have practices, as it refers to groups of potential patients, been a chattel of the medical man. Patients are still free agents and any tendency to restrict their freedom of choice is not only unethical and contrary to the foundation argument of organized medicine against state medicine, but it develops antagonisms which would destroy the very thing that such an effort would seek to maintain.

The second category would comprise those men who were located in communities where there was pre-war too great concentration of doctors, and where during the war the ratio of physician to unit of population was satisfactory to both, and there are such communities, although I know of none in South Carolina. In such communities, it might be harder to reestablish a practice after the war just as it was to establish it originally.

The first of the nine questions negatively suggests that doctors at home do not recognize that doctors in service are making sacrifices. In writing to doctors who have remained at home no argument is necessary. It might be said that our respect for him who has given is not increased by such an one who harps too much about his sacrifices.

The second question is more apropos to what the officer was thinking about. He asks do we sufficiently recognize that we can take "complete advantage" by taking over their practices without a plan of ever giving them up. It is not a question of our taking advantage of those doctors gone to war. It has been of necessity that we care for the medical needs of our communities as best we can. We do not revel in the size of our practices nor glory in the number of patients we have taken from a doctor gone to war. On the other hand, how can we plan to return their practices to them? Will they return and when? Will they wish to carry on as they did before they left? By what standards can one judge whether a patient was his or not his? What will be the patient's attitude toward forcing his employment of his one time doctor? We at home would like to know the service man's attitudes to these questions, not now, but promptly after he returns.

The third question is not clear in intent. It again brings up the question of sacrifices, and asks if we at home do not feel that we are making the sacrifices rather than the service men. I hear nothing of sacrifices in my association with doctors. In discussing long hours, patient over load and high income taxes, there is no spirit of complaint, and the newspaper publicity is more in the nature of apology and explanation for inadequate medical service than it is anything else. But does the doctor mean to suggest that there should be a division of fees collected when he asks, "Do they . . . consider that they are justified in taking and keeping all they can get?" Some isolated efforts have been made to set aside some monies collected from former patients for the physician in service. But plans have not and cannot work. Who is who's patient, specialist's services to general practioner's patients, new comers to the community, cash and credit and collections, and whether to make the division before or after taxes have been paid are some of the questions involved. In the case of partnerships, the matter is more easily handled, and in that of Dr. Dacus and myself everything was happily adjusted until his self-respect and sense of fairness made him decline further revenue from the partnership.

The fourth and fifth questions are rhetorical and no effort will be made to discuss them.

The sixth and seventh questions are repetitious and ask if we realize that we have had unusual opportunities at the expense of our departed confreres and that we have accepted an increased net income made inevitable by the sacrifices of our colleagues.

More than there is space to say could be written on these and some of the writing might be sarcastic and scornful. The doctor does not appreciate nor give credit to what weary men at home have done and are doing. He forgets the old men wholly or partially retired who have ungrudgingly gone back to work and at a pace far beyond their strength.

He overlooks the fact that the mortality rate is higher among civilian physicians than it is among medical officers with combat troops. He disregards the fact that degenerative changes are now being laid down because of over work and too great and continuous nervous strain that will shorten lives later, and that for these there will be no retirement pay, no pensions, no remuneration other than what is salted down now.

In answer to question eight, one has only to recall the men in one's own acquaintance who have asked and pleaded to go to war, those who have wished to go but who have realized that they can be of more value at home, and would soon be a

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burden in the services. Many of those at home would gladly trade places with those in service if that were possible or practical. Even those who were in the last war and whose life plans were disrupted, changed and delayed by such service, would serve again and without grumbling had they the chance.

Number nine is like number one, and needs nor deserves further comment.

One whose thinking is so self-centered and illogical as he who propounded these questions and who poses as the mouth piece for over 100 medical officers or, perhaps, for all medical officers, may be a disturbing element in medical relationships locally, but he cannot have wide influence. The matters that he has raised, of necessity, have to be local issues. Of their very nature they can be neither nation wide nor even state wide.

As to his threat to initiate or support some scheme of governmental controlled practice, he might better remain in one of the services on a salary. He would have his opportunity of free enterprise and competitive advancement limited by the same rules that would control others, and he, at a time when his years of experience, his more mature skill, his knowledge of ways and means of practice building, his wide acquaintance and his vigorous health (as we hope) would give him a great advantage.

It is the fighting man's privilege to grouch about any and all things, and yet he goes ahead and does a swell job. Let's not take him too seriously when he is in a self-pitying mood.

Greenville, S. C. J. Decherd Guess

Dr. Julian P. Price
Florence, S. C.
Dear Julian:

It is time that someone spoke up for the doctor who is doing what is required of him here at home. I hope that this letter or the sentiments contained therein will find a place on your editorial page.

For some days thought has been given the letter reprinted in the August *Journal* from The Nebraska State Medical Journal. I have read and reread this letter many times. All of the good doctors "nine vital questions" are summed up in this one indictment of us at home. "We in the service are making all the sacrifices while you are getting all the gravy." He has overlooked the fact that practically all of us (with some well known geographical exceptions) volunteered our services but were told to stay where we are; that many of us would give our eye teeth to share the comradeship, the experiences, yes, the dangers too, of those in service; that many of us for physical reasons, or for reasons of duty and responsibility at home have been forced to remain out of the armed forces of our country; that many of us are making an earnest effort to remind patients to return to their doctor in service on his return (It is the only fair thing to do).

No plan will have to be, or can be, evolved to return his practice to him. His former patients *will* return, and more too if for no other reason than that he has been in service. The threat, not too well veiled, in his letter, that we at home will be forced "to divide the spoils of war" will do nothing to help bring about a satisfactory conclusion of the matter. I sympathize deeply with the doctor, yet for myself would definitely be glad to trade places with him for a while. He must have had some rather bitter personal experience and appears to have lost all faith in the goodness of his fellow-men. In spite of his written words I do not believe that his is the overall attitude of the physicians in service. If it is, we are lost, all of us, for there can be no common ground where dissatisfaction born of suspicion can meet good works the fruit of fidelity and duty.

Very truly yours,
J. W. Jervey, Jr., M.D.

DEATH

Capt. John W. Speake, former Spartanburg physician, was killed July 28 in an airplane crash in England while serving as a flight surgeon with the U. S. Army Air Forces.

A graduate of Wofford and of the Medical College of the State of South Carorlina (1936), Dr. Speake has practiced in Spartanburg several years before entering the service. He is survived by his wife, the former Miss Levencia Harrington, and two small daughters.

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